



Deliverable D13

Online Platform Testing Results

Work package:	4 (Design and development of the Online Learning Platform)
Due date of deliverable:	June 1 st 2014
Lead beneficiary:	UNIMI
Editors	S. Valtolina
Contributing beneficiaries	UNIMI
Reviewer	B. Apolloni
Status:	Uploaded
Version and date:	Final version, November 25 th 2014
Changes:	Editing

Project co-funded by the European Commission within the Enterprise and Industry DG

Dissemination Level:

PU	Public	PU
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the Consortium (including the Commission Services)	
CO	Confidential, only for members of the Consortium (including the Commission Services)	

Project co-ordinator: Prof. Bruno Apolloni
Università degli studi di Milano
apolloni@di.unimi.it

Contents

Summary	3
Introduction	5
Chapter 1. Methodology	7
1.1 Participants	7
1.2 Procedure	8
1.3 Roles	8
1.4 Ethics	9
Chapter 2. Usability Tasks	10
Chapter 3. Usability Design	13
3.1 Usability Metrics	13
3.2 Scenario Completion	13
Critical problems	13
Non-critical problems.....	13
Subjective Evaluations	14
Scenario Completion Time (time on task).....	14
3.3 Usability Goals.....	14
Completion Rate	14
Problem-free rate.....	14
Time on Task (TOT).....	14
Subjective Measures	14
3.4 Problem Severity	14
Impact	15
Frequency.....	15
Problem Severity Classification	15
Chapter 4. Results of the usability tests.....	16
4.1 First Usability test.....	16
4.2 Second Usability test	20
Conclusion – User satisfaction	23
Annex A. Participants’ profiles	25
Annex B. SUS - A quick and dirty usability scale.....	27
Annex C. IBM CUSQ: Computer Usability Satisfaction Questionnaires.....	28

Summary

This document describes the test plan of the usability analysis carried out during the development of the Social Intelligent Learning Management System (hereafter named NETT platform). The goals of usability testing include establishing a baseline of user performance, establishing and validating user performance measures, and identifying potential design concerns to be addressed in order to improve the efficiency, productivity, and end-user satisfaction.

The usability test objectives are:

- To determine design inconsistencies and usability problem areas within the user interface and content areas. Potential sources of problems may include:
 - *Navigation problems*: failure to locate functions, excessive keystrokes to complete a function, failure to follow recommended screen flow.
 - *Presentation problems*: failure to locate and properly act upon desired information in screens, selection errors due to labelling ambiguities.
 - *Control usage problems*: improper toolbar or entry field usage.
- To exercise the application under controlled test conditions with representative users. Data are used to assess whether usability goals regarding an effective, efficient, and well-received user interface have been achieved.
- To establish baseline user performance and user-satisfaction levels of the user interface for future improvements and usability evaluations.

The system is tailored to give teachers and trainers appropriate knowledge, skills, and innovative tools in the domain of the entrepreneurial education. To this end, the system is endowed with a social network where teachers can formally or informally share experiences supporting their peers with technical training, along with theory and practical examples deriving from mutual and practical experiences in entrepreneurship.

The goal of the platform is thus to support teachers in the formulation of courses in this discipline and create a Social Community where people involved in entrepreneurship education will share specific materials and find concrete helps for realizing an European way of training young people to become entrepreneurs, yet in respect of local industrial and commercial frameworks. Extra services, named meta-services, are integrated in the platform to satisfy the teachers' needs who are demanding users of the platform, that is individuals that are accustomed to produce educational materials and have clear ideas on the topics to be taught according to the level of preparation of the class to which they are intended.

The high-level summaries of findings include:

- Overall task performance
- User difficulties and frustrations with the site
- Significant usability findings (may include positive as well as negative findings)

The document is structured in five chapters:

Chapter 1 presents a detailed description about the methodology used for performing the usability evaluations. The five scenarios tested during the evaluation analysis are described in chapter 2. Chapter 3 aims at presenting the usability design, in particular explaining the metrics and usability goals adopted

during the tests. Chapter 4 presents the results of two different tests: the first focused on an early prototype and a second carried out on a prototype developed taking into account the results of the first test. Finally, the conclusions section reports some consideration about the user satisfaction analysis.

Introduction

The NETT system aims at proposing a solution based on a social oriented strategy where the educational learning process is created and shared from down top by a community of teachers. Specifically, the goal of the site is to provide:

- Credible, trustworthy, reliable, research-based and peer-reviewed contents.
- Timely, current and well organized resources, and knowledge.
- Evergreen reference material that remains applicable over time.

Usability testing is a method to evaluate a product. The current prototype of the system was built in order to perform the experimental study. In its current state it extracts learning contents from an internal repository according to the user needs and specific quality criteria. The standard operational scenario is represented by a teacher who decides to create a new course and wishes to draw the related didactical material. The information he's expecting drawing from the platform is twofold: 1) how to optimally organize the course as for its layout and employed media, and 2) teaching material to fill up into the layout in either their original issue or modified by the teacher himself. To achieve these goals the following services are assessed:

1. Creating teaching courses. The prototype enables teachers to create, delete or modify courses. Specifically it supports them in combining resources into modules, to be in turn integrated in new courses.
2. Tagging the contents with LOM metadata. The prototype drives teachers to set up a set of metadata that need to be associated to courses, modules and resources.
3. Contents navigation. The user is allowed accessing contents identified by metadata and keywords
4. Managing a social network of teachers. The social network supports the definition of communities around a specific disciplinary sector, whose objective is to transform a personal learning experience in the most collaborative and amazing one. The social section is a mean for sharing materials in an informal way. While sharing, teachers can receive private or public feedbacks, which can help them in improving their contributions.

This report aims at presenting the results of a usability evaluation carried out on the first prototype of the NETT system in order to provide a set of guidelines for improving the usability of a next version. According to these first feedbacks a new version of the NETT prototype has been developed and the report presents a new usability evaluation performed for highlighting how the previous usability issues have been fixed. In terms of the usability evaluations, a set of "Usability measures" has been adopted in relation to the number and severity of the evaluation problems discovered. Specifically, as for experiments with users, the measures concern: The Completion Rate, that is the percentage of test participants who successfully complete the task without critical problems; The Problem-free Rate, that is the percentage of test participants who complete the task without any problems (critical or non-critical problems); The Time on Task (TOT), that is the time to complete a scenario; and finally, a set of subjective measures for collecting subjective opinions about specific tasks, times to perform each task, features, and functionalities. Moreover in order to evaluate the User Experience (UX) in experiments with teachers, we considered these "UX metrics" within a Computer System Usability Questionnaire:

Subjective Measures for Satisfaction (IBM CSUQ and SUS rate); System usefulness, Information quality, Interface quality and Overall satisfaction Scale.

The System Usability Scale (SUS - ANNEX B) provides a “quick and dirty”, reliable tool for measuring the usability. It consists of a 10 item questionnaire with five response options for respondents; from strongly agree to strongly disagree. Originally created by John Brooke in 1986, it allows us to evaluate a wide variety of products and services, including hardware, software, mobile devices, websites and applications.

The IBM CSUQ questionnaire (ANNEX C) was used for the subjective satisfaction measure since it has excellent psychometric reliability properties and benefits from a high correlation ($r=0.94$) between the system usability under evaluation and the answers to the 19 questions.

Chapter 1. Methodology

One of the first steps in each round of usability testing is to develop a plan for the test. The purpose of the plan is to document what we are going to do, how we are going to conduct the test, what metrics we are going to capture, number of participants we are going to test, and what scenarios we will use.

The usability evaluation carried out for the NETT system has been conducted by a usability team in Milano, Italy on July-September 2014.

During the usability evaluation, 13 participants were asked to spend one hour with the platform. During this hour, participants:

- Completed a user background questionnaire
- Answered questions about initial site impressions
- Performed real-world tasks on the site while thinking aloud
- Answered questions about their overall satisfaction

This methodology is based on strategy for measuring usability by adopting tests and subjective metrics. The test metrics that we collected during the course of testing are: Successful Task Completion, Critical Problems, Non-Critical Problems, Problem-Free Rate and Time On Task. Instead, the subjective metrics include the questions we asked the participants prior to the sessions (e.g., background questionnaire) and overall ease, satisfaction and likelihood to use/recommend questions when the sessions have been completed. The questionnaires consisted of a set of questions/statements designed to collect information from the respondent about usability, user satisfaction, knowledge, attitudes, opinions, behaviours, facts, and other information. In the following subsections we explain in detail how we recruited the participants, the procedure adopted during the test and the role of usability specialists involved in the experiment.

1.1 Participants

13 participants evaluated NETT platform. ANNEX A presents a complete report about the characteristics used for defining the participants' profiles. The participants' responsibilities were to attempt to complete a set of representative task scenarios presented to them in as an efficient and timely manner as possible, and to provide feedback regarding the usability and acceptability of the user interface. The participants have been invited to provide honest opinions regarding the usability of the application, and to participate in post-session subjective questionnaires and debriefing.

During the usability evaluation, 5 scenarios based on “real-life” tasks have been submitted to the participants. The tasks were presented in random order and participants were instructed about the NETT project goals. The participants received an overview about: The usability test procedure, Equipment and Software information for carrying out their activities.

Prior to conducting the usability test, we piloted test equipment and materials with volunteer participants. We ran the pilot test some days prior to the first test session so that we had time to deal with any technical issues, and to define the critical tasks at the base of each scenario to be tested. Moreover, the pilot test allowed us to:

- Test the equipment

- Provides practice for the facilitator and note-takers
- Get a good sense whether our questions and scenarios are clear to the participant
- Make any last minute adjustments

According to the results of the pilot test, the following tasks were identified:

#	Task
1	Creating a Course
2	Removing a Course
3	Inserting new modules through the metadata search engine
4	Accessing the NETT Social Network
5	Creating a personal folder in the SN

1.2 Procedure

Participants took part in the usability test in remote environments. Personal computer with the Web application and supporting software were used in a typical office environment. The participant's interaction with the Web application were monitored by a facilitator by using Free Video Call Recorder for Skype. Note takers and data logger(s) monitored the sessions, by using tools and services of Google Analytics. The test sessions were videotaped.

Participants took part in the usability test via remote screen-sharing technology. The participant was seated at their workstation in their work environment. Verbal communication was supported via Free Video Call Recorder for Skype.

The facilitator briefed the participant and clarified that s/he was evaluating the Web application, rather than the facilitator himself. Participants completed a pretest demographic and background information questionnaire. Sessions began when all participant questions were answered by the facilitator. The facilitator informed the participant that time-on-task was measured.

The facilitator instructed the participant to read aloud the task description from the printed copy and begin the task. Time-on-task measure began. The facilitator encouraged the participants to "think aloud". The facilitator observed and entered user behavior and comments, and system interaction in a data logging application.

After all task scenarios were attempted, the participant completed the post-test satisfaction questionnaire.

1.3 Roles

The roles involved in a usability test were as follows:

Trainer: Provided training overview prior to usability testing

Facilitator:

- Provides overview of study to participants
- Defines usability and purpose of usability testing to participants
- Assists the participant along the session and the observer along the debriefing sessions
- Responds to participant's requests for assistance

Data Logger: Records participant's actions and comments

Test Observers: Silent observer

1.4 Ethics

All persons involved with the usability test were required to adhere to the following ethical guidelines:

- The performance of any test participant was not be individually attributable. Individual participant's name was not used in reference outside the testing session.
- A description of the participant's performance was not reported to his or her manager.

Chapter 2. Usability Tasks

The usability tasks were derived from test scenarios developed from use cases and with the assistance of subject-matter experts and by using the results of the pilot test. Due to the range and extent of functionality provided in the application, and the short time for which each participant were available, the tasks were the most common and relatively complex among the available functions. The tasks were identical for all participants.

The task descriptions below were reviewed by the application owner, business-process owner, development owner, and/or deployment manager, in order to ensure that the content, format, and presentation were representative of the real use of the total application. Their acceptance was documented before the usability test.

Task 1

Name: Course Creation

Actors: user

Research questions: the objective of this task is to understand how tools for the creation of courses are intuitive and easy to understand.

Scenario:

This scenario aims at supporting the user in creating a course composed by three different modules. To complete this task the user has to register or authenticate himself by using the proper form in the platform NETT, choose the category in which to create the course and then add their own course naming it: "Business development". Then the user needs to enter the following metadata fields:

- The "Course short name" field: "BD1";
- The Keywords field: "Business, development, course, test";
- "Maximum Age" and "minimum age" field (the former bigger than the latter) required to study the course;
- "Background" field. This task asks the user to select two types of skills required for the course and the related degrees of competence;
- "Acquired Skills Metadata" field concerns the skills acquired by the student as a result of having attended the course, and the related degrees of competence;
- The Description field: "Test course for business development".

After the creation of the course, the user has to manage the default settings form inside the course itself. Specifically, she/he has to insert the following metadata:

- The Module name: "Module A";
- The Summary: "Test module for business development";
- The Keywords: "Business, development, module, test";
- Difficulty: "Easy".

Subsequently, the user has to add two other modules, respectively named "Module B" and "Module C". Then, she/he has to manage metadata fields by using the same values used for the "Module A", with exception of the name.

Task 2

Name: Course Removal

Actors: user

Research questions: the objective of this task is to understand whether the procedure for the removal of their courses is easy to use.

Scenario:

The objective is to eliminate a course from the platform. To complete this task the user has to perform the following actions:

- to register or authenticate himself by using the proper form in the NETT platform;
- to click "Site Administration > Courses > Add / Edit / Delete courses";
- to search and delete the course "Business course test".

Task 3

Name: Inserting new modules through the metadata search engine

Actors: user

Research questions: the objective of this task is to understand if the strategy adopted for inserting new modules by using the metadata search engine is understandable.

Scenario:

The goal is to include in the course named "Entrepreneurship course test" two existing modules through a search based on the metadata. Therefore the user has to register or authenticate himself by using the proper form in the platform NETT, then she/he has to look for the course "Entrepreneurship course test" in the category "Entrepreneurial Vision" and perform the following actions:

- to click the button "Add modules through metadata";
- to find the modules using the filters of the search engine.

Task 4

Name: Access to the NETT Social Network

Actors: user

Research questions: the objective of this task is to understand if the "Home link" to access the NETT Social Network is easy to locate, or if the user can easily understand how to access the service offered by Mahara System.

Scenario:

The objective is to log in the NETT Social Network from the Home site page. Therefore, the user has to perform the following actions:

- to register or authenticate himself by using the proper form in the platform NETT;
- to access the social platform through the appropriate link placed on the homepage;
- to return to the NETT homepage using the appropriate link on the NETT Social environment.

Task 5

Name: Creation of a personal folder in the SN

Actors: user

Research questions: the objective of this task is to understand if the strategy adopted for creating and transferring files in the NETT Social Platform requires a user guide to help the users in their activities, or the process is easy to understand by itself.

Scenario:

In this task the user has to create a personal folder in NETT Social Network Platform. After the authentication, the user has to perform the following actions:

- to enter into the NETT Social Platform;
- to click "Content > Files" command;
- to create a new personal folder named "Social Network files";
- to upload an empty text file;
- to create a new personal folder named "Subfolder Social Network";
- to enter a text file into the folder "Subfolder Social Network";
- to enter the folder "Subfolder Social Network" into the folder "Social Network files".

Chapter 3. Usability Design

3.1 Usability Metrics

Usability metrics refers to user performance measured against specific performance goals necessary to satisfy usability requirements. Scenario completion success rates, adherence to dialog scripts, error rates, and subjective evaluations were used. Time-to-completion of scenarios was also collected.

3.2 Scenario Completion

Each scenario requires that the participant obtains or inputs specific data that would be used during the execution of a typical task. The scenario is completed when the participant indicates that the scenario's goal has been obtained (whether successfully or unsuccessfully) or the participant requests and receives sufficient guidance to score a scenario as a critical problem.

Critical problems

Critical problems are deviations from the targets of the scenario at completion. Obtaining or otherwise reporting the wrong data value due to participant workflow is a critical problem. Participants may or may not be aware that the task goal is incorrect or incomplete.

Independent completion of the scenario is a universal goal; help obtained from the other usability test roles is cause to score the scenario a critical problem. Critical problems can also be assigned when the participant initiates (or attempts to initiate) an action belonging to the goal that becomes unobtainable. In general, critical problems are unresolved problems during the process of completing a task or problems that produce an incorrect outcome. In the NETT platform critical problems concern problems in creating, deleting or modifying courses/modules (Tasks: 1, 2 and 3) and in interacting with the social Network platform (Tasks: 4 and 5).

Non-critical problems

Non-critical problems are problems that are recovered from by the participant or, if not detected, do not lead to processing problems or unexpected results. Although non-critical problems can be undetected by the participant, when they are detected they are generally frustrating to the participant.

These problems may be procedural, in which the participant does not complete a scenario in the most optimal means (e.g., excessive steps and keystrokes). These problems may also be due to confusion (ex., initially selecting the wrong function, using a user-interface control incorrectly such as attempting to edit an un-editable field).

Noncritical problems can always be recovered from during the process of completing the scenario. Exploratory behavior, such as opening the wrong menu while searching for a function, is coded as a non-critical problem.

Subjective Evaluations

Subjective evaluations regarding ease of use and satisfaction are collected via questionnaires, and during the debriefing at the conclusion of the session. The questionnaires are based on IBM CSUQ and SUS questionnaire; they use closed-form responses and rating scales.

Scenario Completion Time (time on task)

The time to complete each scenario, not including subjective evaluation durations, has been recorded.

3.3 Usability Goals

We here describe the usability goals adopted during the evaluation of the NETT platform.

Completion Rate

Completion rate is the percentage of test participants who successfully complete the task without critical problems. A critical problem is defined as a problem that results in an incorrect or incomplete outcome. In other words, the completion rate represents the percentage of participants who, when they have finished the specified task, get an "output" that is correct. Note: If a participant requires assistance in order to achieve a correct output then the task is scored as a critical problem and the overall completion rate for the task is affected by this.

A completion rate of [100%/enter completion rate] is the goal for each task in this usability test.

Problem-free rate

Problem-free rate is the percentage of test participants who complete the task without any problem (critical or non-critical problems). A non-critical problem is a problem that would not have an impact on the final output of the task but would result in the task being completed less efficiently.

A Problem-free rate of [80%/problem error-free rate] is the goal for each task in this usability test.

Time on Task (TOT)

The time to complete a scenario is referred to as "time on task". It is measured from the time the person begins the scenario to the time he/she signals completion.

Subjective Measures

Subjective opinions about specific tasks, time to perform each task, features, and functionality have been surveyed. At the end of the test, participants rated their satisfaction with the overall system. Combined with the interview/debriefing session, these data have been used to assess attitudes of the participants.

3.4 Problem Severity

To prioritize recommendations, a method of problem severity classification has been used in the analysis of the data collected during evaluation activities. The approach treats problem severity as a combination

of two factors: the impact of the problem and the frequency of users experiencing the problem during the evaluation.

Impact

Impact is the ranking of the consequences of the problem by defining the level of impact that the problem has on successful task completion. There are three levels of impact:

- **High** - prevents the user from completing the task (critical problem)
- **Moderate** - causes user difficulty but the task can be completed (non-critical problem)
- **Low** - minor problems that do not significantly affect the task completion (non-critical problem)

Frequency

Frequency is the percentage of participants who experience the problem when working on a task.

- **High**: 30% or more of the participants experience the problem
- **Moderate**: 11% - 29% of the participants experience the problem
- **Low**: 10% or fewer of the participants experience the problem

Problem Severity Classification

The identified severity for each problem implies a general reward for resolving it, and a general risk for not addressing it, in the current release.

Severity 1 - High impact problems that often prevent a user from correctly completing a task. They occur with various frequencies and generally they are related to Help Desk calls. Their resolutions are seldom rewarded by reduced redevelopment costs.

Severity 2 - Moderate to high frequency problems with moderate to low impact are typical generated by erroneous actions that the participant recognizes to be avoided. Their resolution resolution is typically rewarded by reduced time on task and decreased training costs.

Severity 3 - Either moderate problems with low frequency or low problems with moderate frequency; these are minor annoyance problems faced by a number of participants. . Their resolution is typically rewarded by reduced time on task and increased data integrity.

Severity 4 - Low impact problems faced by few participants; there is a low risk of not resolving these problems. Their resolution is typically rewarded by increased user satisfaction.

Chapter 4. Results of the usability tests

This chapter presents the result of a first usability test carried out on the NETT platform according to the scenarios described in chapter 2. The results of this usability evaluation provided a set of guidelines for improving the usability of a prototype second version.

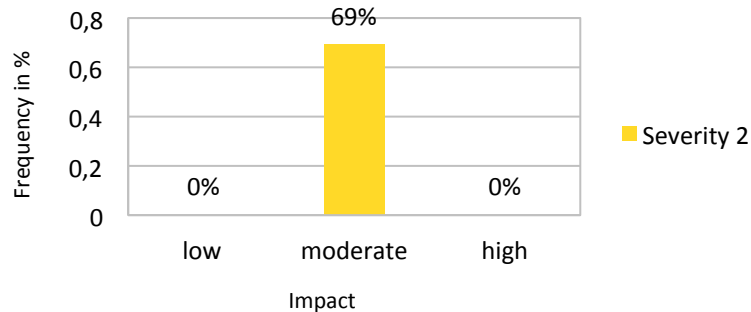
4.1 First Usability test

Task 1: Course Creation

Add new modules

Percentage of requested assistance	39 %
Type of suggestions provided to the users	Indication of the button to add new modules
User Comments	It is not easy to identify the button for adding new modules. It is not intuitive.
Impact	Moderate - Non-critical problems
Frequency	69 % - High

Problem severity



Solutions:

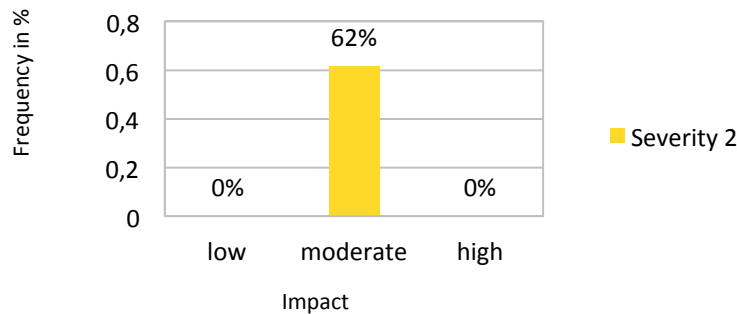
The idea is to replace the label of the button for adding new modules with the phrase "Add a new module". The button has to be graphically similar to the existing ones.

Task 2: Course Removal

Percentage of task completed	93 %
Percentage of requested assistance	0 %
Type of suggestions provided to the users	no suggestions
Avg TOT	00.04.23

Percentage of task completed	93 %
Avg click	14
Notes	85 % of users have used a search engine button
User Comments	It is not easy to understand how to delete a course. The user expects to have a menu that contains the courses and options for managing/deleting a course. It is not intuitive.
Impact	Moderate - Non-critical problems
Frequency	62 % - High

Problem severity

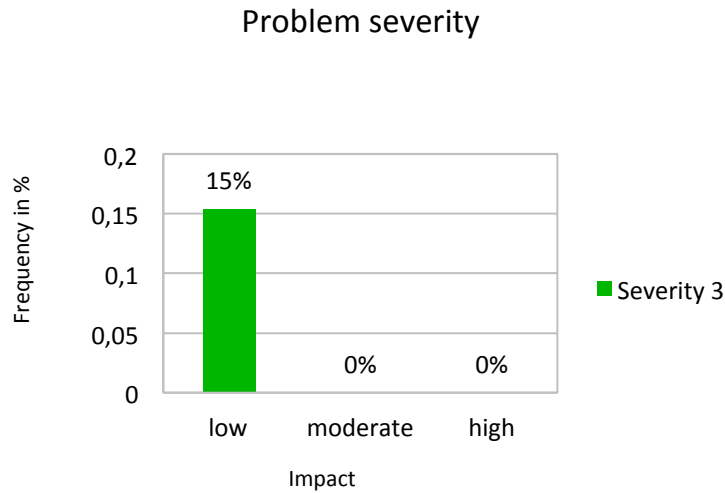


Solutions:

The idea is to replace the sub-item "Add / edit courses", inside the block "Administration", in "Add / Edit / Remove courses." Moreover, in the "Add / Edit courses", we need to replace the list of categories, with a list of classes or the class of membership if the authenticated user is not an Administrator.

Task 3: Inserting new modules through the metadata search engine

Percentage of task completed	100 %
Percentage of requested assistance	0 %
Type of suggestions provided to the users	no suggestions
Avg TOT	00.05.13
Avg click	8
User Comments	no comments
Impact	Low - Non-critical problems
Frequency	15 % - Moderate



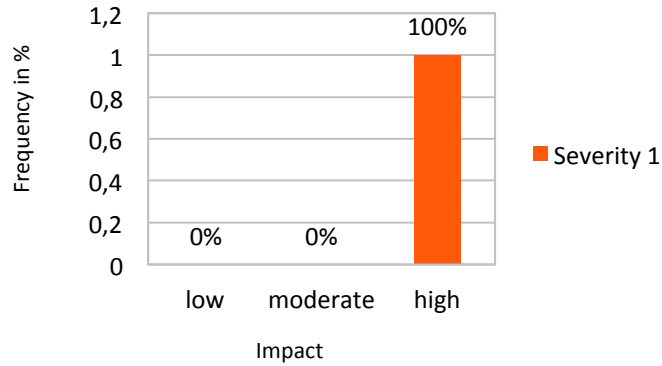
Solutions: no changes to be made.

Task 4: Access to the NETT Social Network

** In the test phase, the Social platform is still an early prototype; the multi-language facility is not available.*

Percentage of task completed	46 %
Percentage of requested assistance	0 %
Type of suggestions provided to the users	no suggestions
Avg TOT	00.01.50
Avg click	4
User Comments	The link for entering the Social Platform and the link for returning to the homepage are not evident and intuitive.
Impact	High – critical problem
Frequency	100 % - High

Problem severity



Solutions:

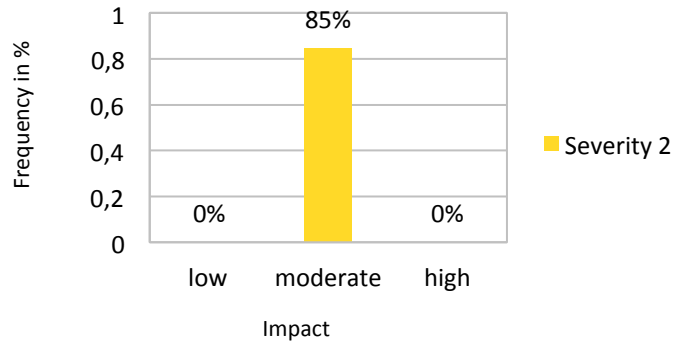
The idea is to highlight the links and to replace the link "Home-Mahara" in "NETT Social Network" or "NETT Social". Finally, we need to replace the link to return to the "NETT homepage" in "Back to the NETT platform" or "NETT Platform".

Task 5: Creation of a personal folder in the SN

** In the test phase, the Social platform is still an early prototype; the multi-language facility is not available.*

Percentage of task completed	46 %
Percentage of requested assistance	0 %
Type of suggestions provided to the users	no suggestions
Avg TOT	00.06.03
Avg click	11
User Comments	It is not intuitive the user interface for creating folders. The English version is not available.
Impact	Moderate - Non-critical problems
Frequency	85 % - High

Problem severity



Solutions:

We need to implement a multi-language translation of the Social Platform and to insert small explanations, or highlight those already available, near the links and buttons.

4.2 Second Usability test

According to these first feedbacks a new version of the NETT Platform has been carried out. In this chapter a new usability evaluation is described in order to highlight how the previous usability issues have been fixed

Task 1: Course Creation

Percentage of task completed	100 %
Percentage of requested assistance	0 %
Type of suggestions provided to the users	---
Avg TOT	00.07.40
Avg click	11
User Comments	---
Impact	---
Frequency	---

Task 2: Course Removal

Percentage of task completed	100 %
Percentage of requested assistance	0 %
Type of suggestions provided to the users	---

Percentage of task completed	100 %
Avg TOT	00.00.57
Avg click	7
User Comments	---
Impact	---
Frequency	---

Task 3: Inserting new modules through the metadata search engine

Percentage of task completed	100 %
Percentage of requested assistance	0 %
Type of suggestions provided to the users	---
Avg TOT	00.01.17
Avg click	4
User Comments	---
Impact	---
Frequency	---

Task 4: Access to the NETT Social Network

Percentage of task completed	100 %
Percentage of requested assistance	0 %
Type of suggestions provided to the users	---
Avg TOT	00.00.37
Avg click	3
User Comments	---
Impact	---
Frequency	---

Task 5: Creation of a personal folder in the SN

Percentage of task completed	100 %
Percentage of requested assistance	0 %
Type of suggestions provided to the users	---
Avg TOT	00.03.40
Avg click	7
User Comments	---

Percentage of task completed	100 %
Impact	---
Frequency	---

Conclusion – User satisfaction

SUS questioner (first ten questions – Annex B)

We assigned to the user replies a value using the scale 1-5 (where 1 is “strongly disagree” and 5 is “strongly agree”). We normalized these values according to the SUS scale taking into account the negative or positive connotation of each item (the odd items have a positive connotation and the even ones a negative connotation). The values have been added according to this SUS score calculation:

- For odd items: subtract one from the user response.
- For even-numbered items: subtract the user responses from 5
- This scales all values from 0 to 4 (with four being the most positive response).
- Add up the converted responses for each user and multiply that total by 2.5. This converts the range of possible values from 0 to 100 instead of from 0 to 40.

The final result is not a percentage but a value that is more positive if it is close to 100. According to the SUS protocol a result can be considered positive if it is more than 68. The image [Figure 1] below shows how the percentile ranks associate with SUS scores and letter grades.

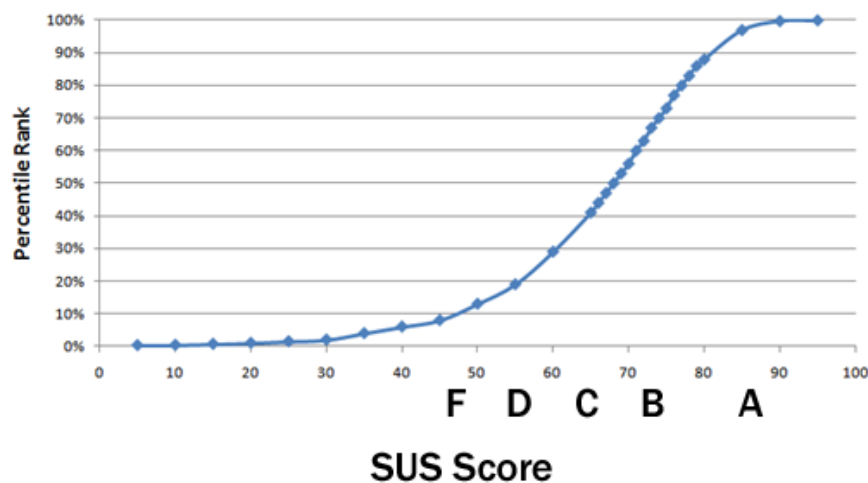


Figure 1. Percentile ranks associate with SUS scores and letter grades

The SUS result of the first analysis is 53, and so lower than the sufficiency threshold. The same value in percentile is 17 % and the grade is D. Instead, the SUS score of the second analysis is 63, therefore still under the sufficiency but in percentile is 36 % with grade C, highlighting an increasing result in respect to the first analysis.

CSUQ (last nineteen questions – Annex C)

In order to clarify what problems caused a result under the sufficiency threshold in both the analyses, it is necessary to evaluate the result of a second set of questions reported into the questionnaires provided to the participants. Also in this case we assigned to the replies a value in the scale 1-5 (where 1 is “strong disagree” and 5 is “strong agree”). The average trend of the replies was also evaluated according to a cluster of issues for focusing the attention on specific aspects of the system.

- SYSUSE (items from 1 to 8 plus item 19): For measuring the utility of the NETT Platform. Result: 3,89
- INFOQUAL (item 9-15): For measuring the quality of the information. Result: : 3,71
- INTERQUAL (items 16-18): for measuring the quality of the interface. Result: 3,67
- OVERALL (all items): For measuring the general satisfaction. Result: 3,79

Given the results scale, we can claim that the weak point of our system is the interface considering that the INTERQUAL has the lowest value. Instead, the better result is the SYSUSE and so we can claim that the participants had the impression that our system is useful.

Annex A. Participants' profiles

Audience Type

University professor / Teacher	46 %
Freelancer / Consultant	31 %
Retired	8 %
Undergraduate	15 %
TOTAL (participants)	100 %

Gender

Women	69 %
Men	31 %
TOTAL (participants)	100 %

Age

26-39	46 %
40-59	46 %
60-74	8 %
< 75	0 %
TOTAL (participants)	100 %

Qualification

University degree	77 %
High school graduation	23 %
TOTAL (participants)	100 %

Known languages

English	92 %
French	46 %
German	15 %
Spanish	31 %
Chinese	8 %
Bulgarian	8 %
Italian	92 %

Participation in usability testing in the last 6 months

Yes	62 %
No	38 %
TOTAL (participants)	100 %

Note: Every user knows more than one language

Computer Usage

0 hrs. wk.	0 %
1 to 10 hrs. wk.	15 %
11 to 25 hrs. wk.	15 %
26 to 40 hrs. wk.	39 %
40+ hrs. wk.	31 %
TOTAL (participants)	100 %

Computer activities

Game / Entertainment	0 %
Read news	0 %
Commercial / banking	8 %
Graphic design / digital pictures	8 %
Programming / word	76 %

processing	
Other	8 %
TOTAL (participants)	100 %

Operating system

Mac os x	8 %
Windows 7	61 %
Windows 8	23 %
Lion os x	8 %
TOTAL (participants)	100 %

Browser

Google Chrome	31 %
Internet Explorer	38 %
Mozilla Firefox	23 %
Safari	8 %
TOTAL (participants)	100 %

E-learning website visited

1 to 2 time . yr.	38 %
1 to 2 time. Mth.	8 %
1 to 2 time . wk.	23 %
About every day	31 %
Never	0 %
TOTAL (participants)	100 %

E-learning platform to support the teaching activities

Moodle	54 %
No any	46 %
Other	0 %
TOTAL (participants)	100 %

Entrepreneurial experience					
Level of expertise	Entrepreneurial Vision	Personal Development	Communication Skills	Economic Skills	Technical Skills
1	38 %	8 %	23 %	38 %	15 %
2	0 %	8 %	0 %	38 %	15 %
3	23 %	23 %	31 %	15 %	0 %
4	31 %	15 %	23 %	8 %	38 %
5	8%	46 %	23 %	1 %	32 %
tot	100%	100%	100%	100%	100%

Annex B. SUS - A quick and dirty usability scale

Brooke, J. SUS: A quick and dirty usability scale, In: Taylor and Francis, 1996

	Strongly Disagree					Strongly agree
1. I think that I would like to use this system frequently	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
2. I found the system unnecessarily complex	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
3. I thought the system was easy to use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
4. I think that I would need the support of a technical person to be able to use this system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
5. I found the various functions in this system were well integrated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
6. I thought there was too much inconsistency in this system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
7. I would imagine that most people would learn to use this system very quickly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
8. I found the system very cumbersome to use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
9. I felt very confident using the system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
10. I needed to learn a lot of things before I could get going with this system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	

Annex C. IBM CUSQ: Computer Usability Satisfaction Questionnaires

Lewis, J. R. IBM Computer Usability Satisfaction Questionnaires: Psychometric Evaluation and Instructions for Use. International Journal of Human-Computer Interaction, 1995, 7:1, 57-78

	Strongly Disagree					Strongly agree
1. Overall, I am satisfied with how easy it is to use this system	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>					
	1	2	3	4	5	
2. It was simple to use this system	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>					
	1	2	3	4	5	
3. I can effectively complete my work using this system	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>					
	1	2	3	4	5	
4. I am able to complete my work quickly using this system	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>					
	1	2	3	4	5	
5. I am able to efficiently complete my work using this system	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>					
	1	2	3	4	5	
6. I feel comfortable using this system	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>					
	1	2	3	4	5	
7. It was easy to learn to use this system	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>					
	1	2	3	4	5	
8. I believe I became productive quickly using this system	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>					
	1	2	3	4	5	
9. The system gives error messages that clearly tell me how to fix problems	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>					
	1	2	3	4	5	
10. Whenever I make a mistake using the system, I recover easily and quickly	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>					
	1	2	3	4	5	

11. The information (such as online help, on-screen messages, and other documentation) provided with this system is clear

1	2	3	4	5

12. It is easy to find the information I needed

1	2	3	4	5

13. The information provided for the system is easy to understand

1	2	3	4	5

14. The information is effective in helping me complete the tasks and scenarios

1	2	3	4	5

15. The organization of information on the system screens is clear

1	2	3	4	5

16. The interface of this system is pleasant

1	2	3	4	5

17. I like using the interface of this system

1	2	3	4	5

18. This system has all the functions and capabilities I expect it to have

1	2	3	4	5

19. Overall, I am satisfied with this system

1	2	3	4	5